

NATIONAL PARK SERVICE
NAVIGATION CHANNEL
DAVIS BAYOU, MISSISSIPPI

SEPTEMBER 1986



**US Army Corps
of Engineers**
Mobile District

NATIONAL PARK SERVICE NAVIGATION CHANNEL
DAVIS BAYOU, MISSISSIPPI

PURPOSE AND SCOPE OF STUDY

The purpose of this preliminary, or first, phase of study was to determine the necessary scope of the work and obtain a preliminary estimate of dredging cost. An initial work item was to obtain hydrographic surveys of the entire channel. Reduced prints of these surveys are included as Figure 1. Information on channel bottom sampling locations and a listing of parameters for the sediment analysis were furnished in a Corps of Engineers letter of August 6, 1986 for forwarding to the Gulf Coast Research Laboratory, who it was agreed would obtain the samples and perform the analyses. The listing of parameters and the map showing the sampling locations are included as Table 1 and Figure 2, respectively.

TABLE 1
DESIRED PARAMETER ANALYSIS FOR
CHANNEL BOTTOM SAMPLES

Bottom Sediment Grain Size	Aluminum	Lead
Total Kjeldahl Nitrogen	Arsenic	Manganese
Total Phosphorus	Cadmium	Mercury
Total Organic Carbon	Chromium	Nickel
Total Oil and Grease	Copper	Silver
Total Hydrocarbons	Iron	Zinc

INFORMATION DEVELOPED

In discussions between the Park Service and Corps of Engineers it was stated that a 6- by 50-foot channel was desired, with 2 feet of advance maintenance to reduce the frequency of dredging. Utilizing the hydrographic survey data, dredging quantities and costs were computed for two plans (options 1 and 2). Computations for option 1 are based on dredging to a maximum depth of 8 feet for the entire length of the project. Option 2 prescribes restoring the 6-foot project depth of the channel, with advance maintenance only where the existing project depth is less than 6 feet. Preliminary computations and cost estimates give the following total yardages for each option:

Option 1 - 71,790 cubic yards
Option 2 - 62,760 cubic yards

A preliminary investigation was conducted to determine possible locations to dispose of the dredged material. Because there appear to be no available upland sites in the area, in-water disposal was considered to be the only viable alternative. In order to provide the greatest latitude in selecting possible disposal areas, the dredging quantities were computed by channel reach. These data are provided in Table 2 and the dredging reaches are shown on Figure 3.

TABLE 2
DREDGING QUANTITIES BY REACH
(CUBIC YARDS)

<u>REACH</u>	<u>OPTION 1 QUANTITIES</u>	<u>OPTION 2 QUANTITIES</u>
E-D	8,360	8,360
D-C	16,670	16,670
C-B	4,050	0
B-A	7,870	2,890
A-Z	<u>34,840</u>	<u>34,840</u>
TOTALS	71,790	62,760

Also shown on Figure 3 are disposal area alternatives near and within Davis Bayou. For this phase 1 report, it is assumed that no important contaminant exists in the channel bottom sediments. A description of the disposal plan alternatives is given in Table 3. The location of the disposal area shown in Table 3 as No. 5 Part A is shown on Figure 4, and the bathymetry of the site is shown on Figure 5.

Cost estimates were computed for the use of a 12-inch pipeline dredge. Larger dredges, which may be more economical, cannot operate efficiently--if at all--in a 50-foot-wide channel. The 12-inch dredge can pump to about a 3,500-foot distance without a booster. Estimated cost and time for the two plans are:

Option 1 - \$243,000, 1.4 months
Option 2 - \$218,000, 1.2 months

CONCLUSIONS

Based on our experience with dredging in similar situations, and the limited history of conditions in Davis Bayou, we see little advantage of option 2 over option 1. Option 1 provides for about 3,750 feet of advance maintenance dredging in reaches A-B and B-C that is not provided by option 2. It is to be noted that parts of these reaches are among the areas that would require dredging most frequently.

TABLE 3
DISPOSAL PLAN ALTERNATIVES

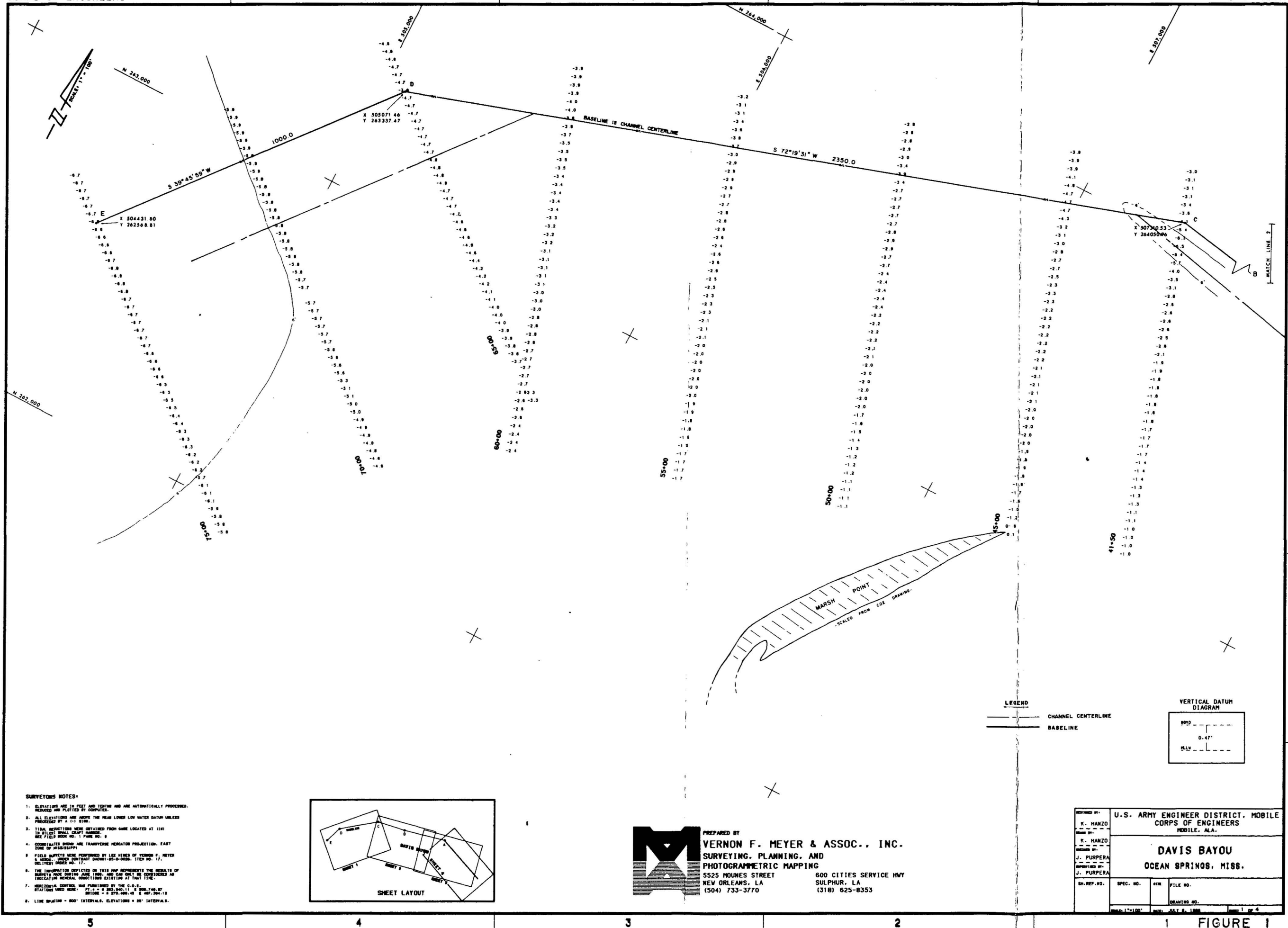
DISPOSAL PLAN ALTERNATIVE	DREDGING REACHES	DISPOSAL QUANTITY		DISPOSAL LOCATION
		OPTION NO. 1	OPTION NO. 2	
No. 1 Part A	E-D, D-C + C-B	29,080 cy	25,030 cy	In Biloxi Bay along Beach West of Marsh Point.
No. 1 Part B	B-A + A-Z	42,710 cy	37,730 cy	In Davis Bayou parallel to B-A Reach West of existing disposal area
No. 2 Part A	E-D, D-C + C-B	29,080 cy	25,030 cy	In Biloxi Bay along Beach West of Marsh Point.
No. 2 Part B	B-A + A-Z	42,710 cy	37,730 cy	In Davis Bayou adjacent to existing area on North side.
No. 3 Part A	E-D, D-C + C-B	29,080 cy	25,030 cy	In Davis Bayou along Beach East of Marsh Point.
No. 3 Part B	B-A + A-Z	42,710 cy	37,730 cy	In Davis Bayou parallel to B-A Reach West of existing disposal area
No. 4 Part A	E-D, D-C + C-B	29,080 cy	25,030 cy	In Davis Bayou along Beach East of Marsh Point.
No. 4 Part B	B-A + A-Z	42,710 cy	37,730 cy	In Davis Bayou adjacent to existing area on North side.
No. 5 Part A*	E-D, D-C + C-B	29,080 cy	25,030 cy	In Biloxi Bay in existing Disposal Area No. 6.
No. 5 Part B	B-A + A-Z	42,710 cy	37,730 cy	Either No. 1 Part B or No. 2 Part B.

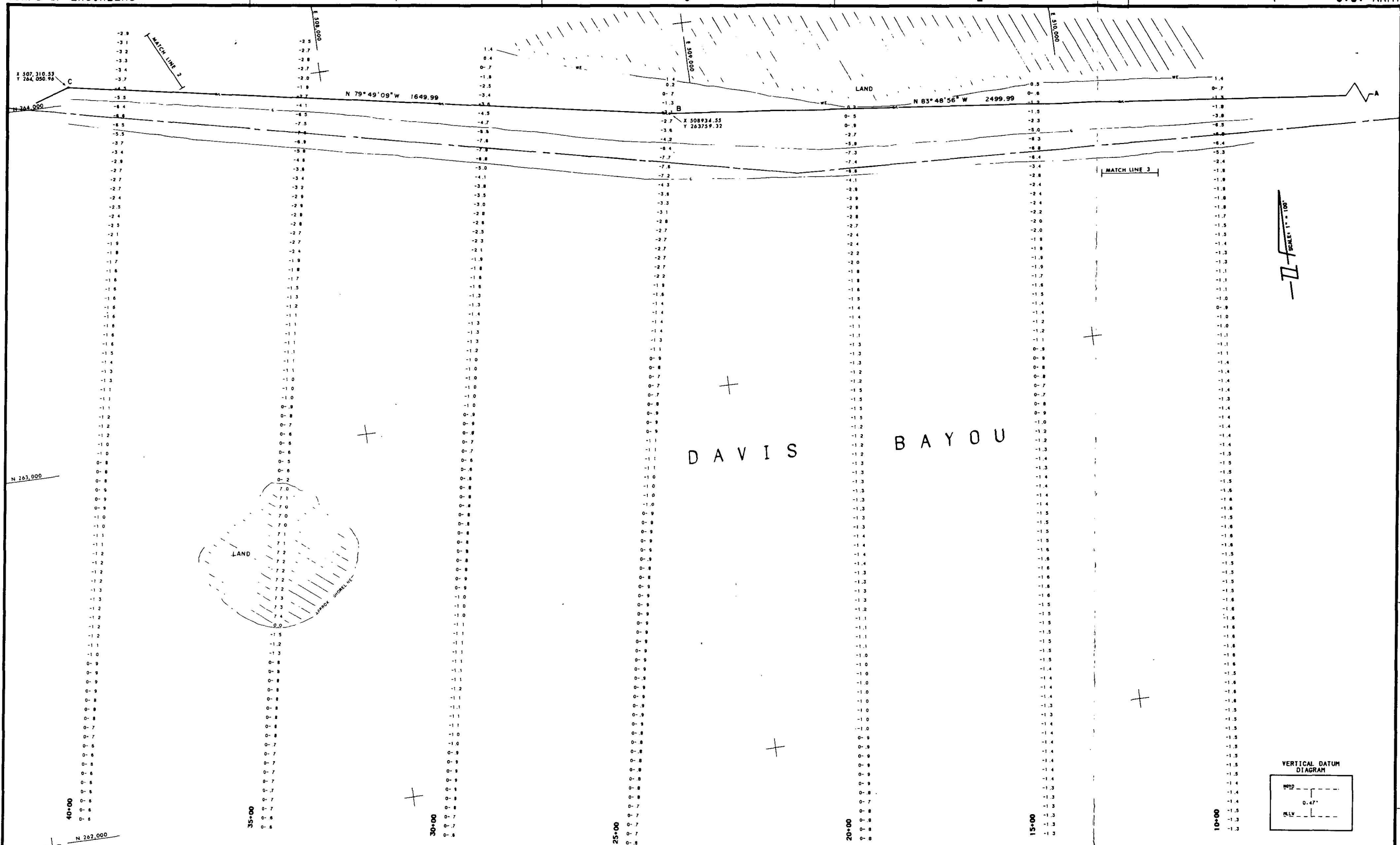
NOTE: *This disposal option would add approximately \$87,000 in cost because of the need to use booster pumps.

RECOMMENDATIONS

It is recommended that option 1, which provides a 6-foot project depth and advance maintenance of an additional 2 feet over the entire channel, be selected for implementation.

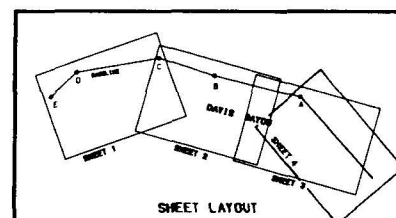
It is also recommended that permanent markers be installed at selected locations along the channel to serve as navigational aids and points of reference. These could be single piles at the turns in the channel and can be installed for a total cost of about \$5,000.





SURVEYORS NOTES:

1. ELEVATIONS ARE IN FEET AND TENTHS AND ARE AUTOMATICALLY PROCESSED, REDUCED AND PLOTTED BY COMPUTER.
2. ALL ELEVATIONS ARE ABOVE THE MEAN LOWER LOW WATER DATUM UNLESS INDICATED BY A C-1 SIGN.
3. TIDAL NOTATIONS WERE OBTAINED FROM GAGE LOCATED AT (107) IN BILLOUT SHALL CRAFT HARBOR. SEE FIELD BOOK NO. 1 PLANE NO. 8.
4. COORDINATES SHOWN ARE TRANSVERSE MERCATOR PROJECTION, EAST ZONE OF MISSISSIPPI.
5. FIELD SURVEYS WERE PERFORMED BY LEE HINES OF VERNON F. MEYER & ASSOC., UNDER CONTRACT DATED FEBRUARY 1988. TITAN NO. 17.
6. THE INFORMATION DEPICTED ON THIS MAP REPRESENTS THE RESULTS OF SURVEYS MADE DURING JUNE, 1988, AND CAN ONLY BE CONSIDERED AS INDICATING GENERAL CONDITIONS EXISTING AT THAT TIME.
7. HORIZONTAL CONTROL WAS FURNISHED BY THE C.O.E. STATIONS USED WERE: 1. C.O.E. 2. 263,000.00; 3. 263,000.00; 4. 263,000.00; 5. 263,000.00; 6. 263,000.00; 7. 263,000.00; 8. 263,000.00; 9. 263,000.00; 10. 263,000.00; 11. 263,000.00; 12. 263,000.00.
8. LINE SPACING = 300' INTERVALS, ELEVATIONS = 25' INTERVALS.



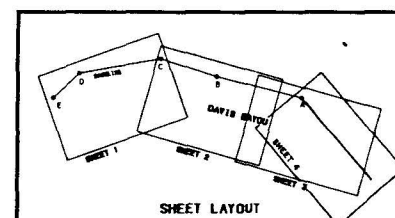
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VERNON F. MEYER & ASSOC., INC.
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PHOTOGRAMMETRIC MAPPING
5525 MOUNTS STREET
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DESIGNED BY: K. HANZO				U.S. ARMY ENGINEER DISTRICT, MOBILE CORPS OF ENGINEERS MOBILE, ALA.			
CHECKED BY: K. HANZO				DAVIS BAYOU			
SURVEYED BY: J. PURPERA				OCEAN SPRINGS, MISS.			
DRAWING NO.:				SHEET 2 OF 4			



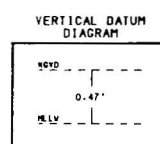
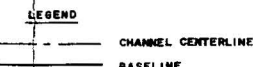
1. ELEVATIONS ARE IN FEET AND TENSINS ARE AUTOMATICALLY PROCESSED
RECEIVED AND PLOTTED BY COMPUTER.
2. ALL ELEVATIONS ARE ABOVE THE LOW LOW LOW WATER DATA UNLESS
PRECEDED BY A 1-2 SIGN
3. TIME MEASUREMENTS WERE OBTAINED FROM DATA LOCATED AT 15N
IS 16.11, SMALL CRAFT PIER, 0
SEE FIELD BOOK NO. 1 PAGE NO. 9
4. COORDINATE MEASURES ARE TRANSVERSE RECTANGULAR, EAST
CENT, 4000000.00
5. FIELD MEASUREMENTS WERE PERFORMED BY LEE KILMER OF TROBROOK F. WETER
A. HERRICK, UNDER CONTRACT DAWH01-59-0026, ITEM NO. 17.
DEL. FIELD NO. 10
6. THE INFORMATION SPECIFIED ON THIS MAP REPRESENTS THE RESULTS OF
SURVEY DATA DURING JUNE 1960, AND CAN ONLY BE CONSIDERED AS
A GENERAL INDICATION OF CONDITIONS EXISTING AT THE TIME.
7. HORIZONTAL CONTROL WAS FURNISHED BY THE C.O.R.
STATION NUMBER USED: PL 1-4 = 285,840.21 E 500,749.19
NAD 83 DATUM 1983, 1983 AND 1983
8. LINE SPACING - 0.01 INCHES, ELEVATIONS - 20' INTERVALS



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DAVIS BAYOU OCEAN SPRINGS, MISS.			
SH. REF. NO.	SPEC. NO.	SIZE	FILE NO.
DRAWING NO.			
DATE		BY	SCALE

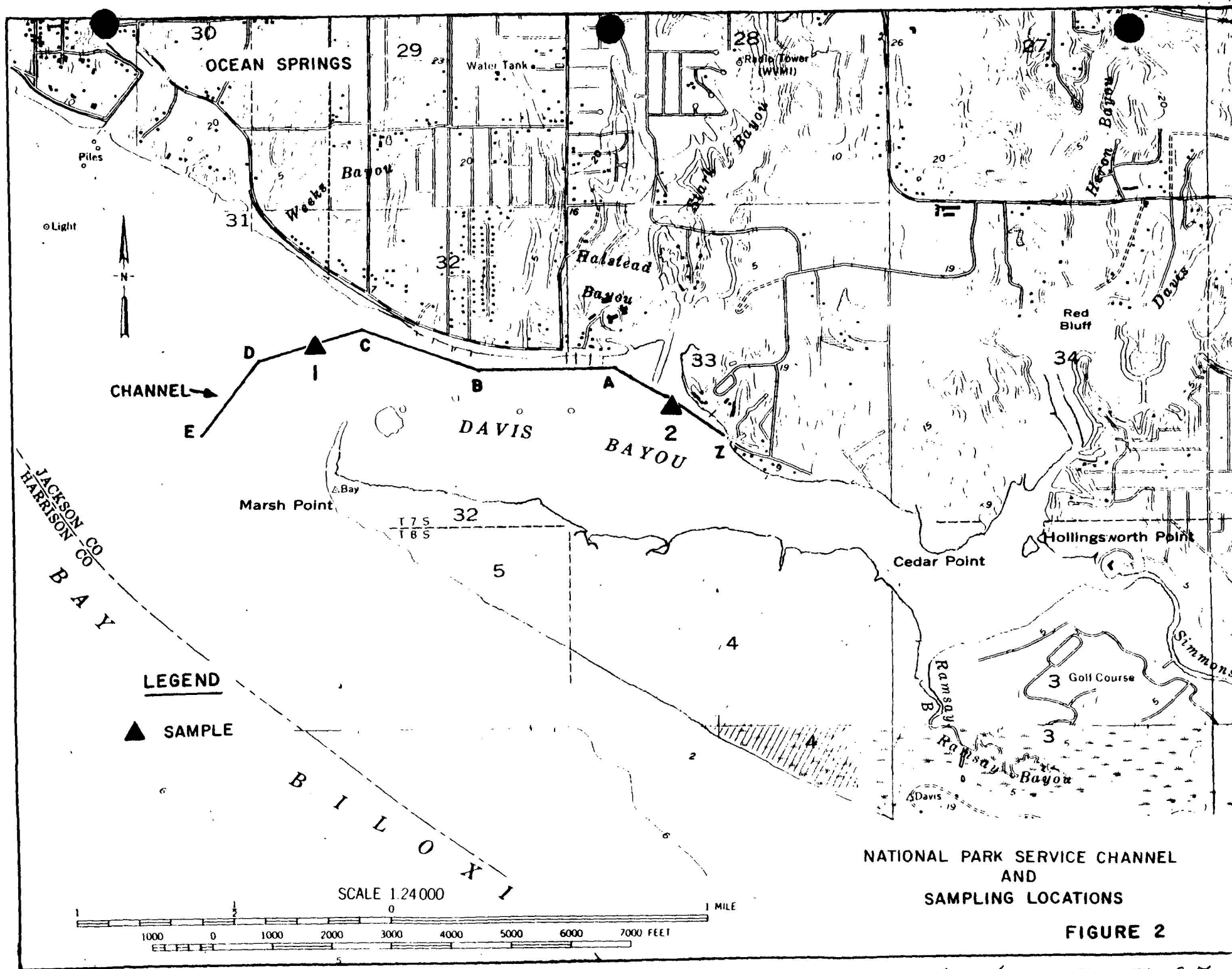
MASTER DELETED - 1400-00277, DATE 28 00-JUL-00 18:00 / 00
635/60905 3 of 7



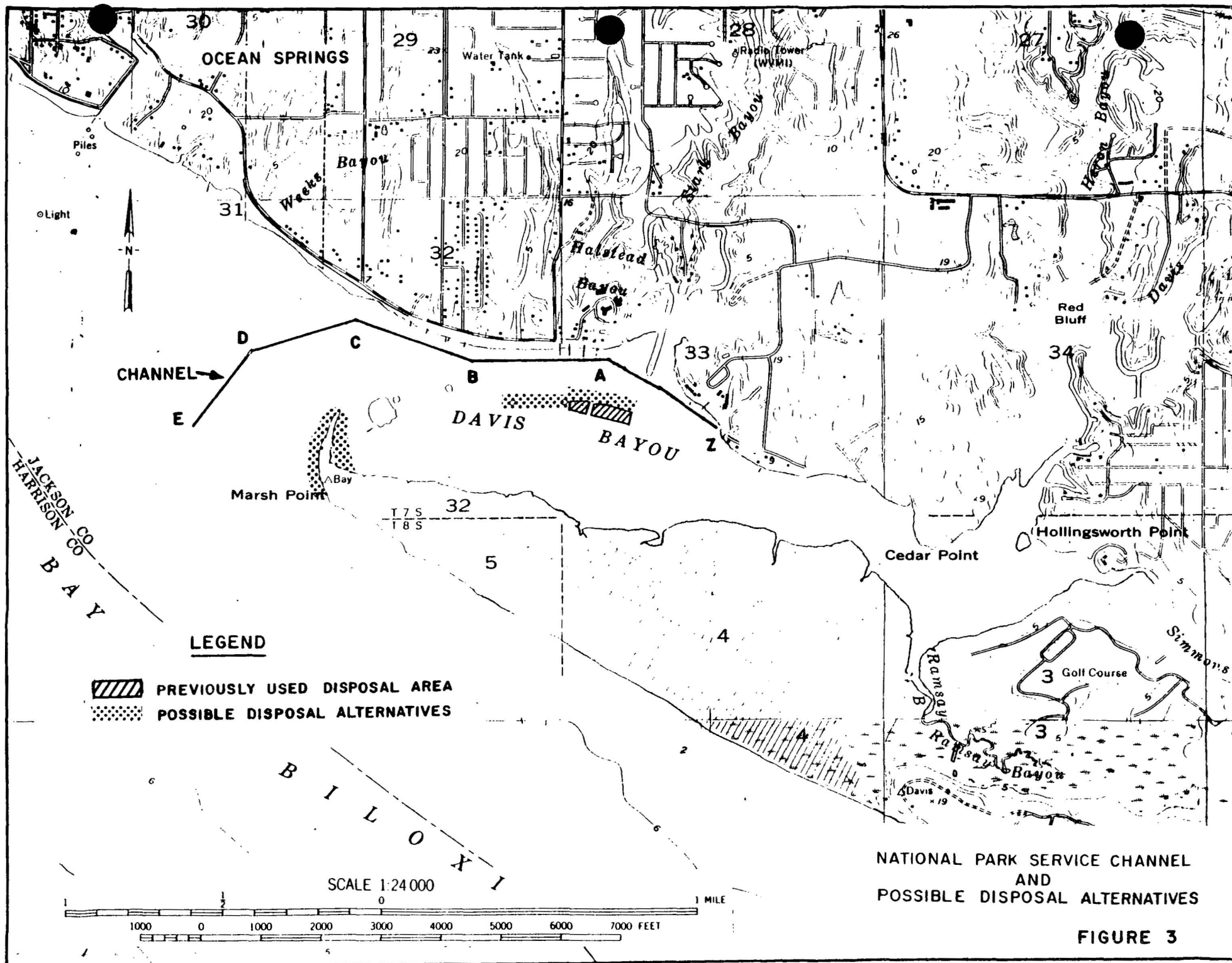
1. ELEVATIONS ARE IN FEET AND TENTHS AND ARE AUTOMATICALLY PROCESSED AND REDUCED AND PLOTTED BY COMPUTER.
2. ALL ELEVATIONS ARE ABOVE THE MEAN LOW LOW WATER DATUM UNLESS PRECEDED BY A (-) SIGN.
3. TIDAL REDUCTIONS WERE OBTAINED FROM GAGE LOCATION AT (1N) IN FIELD. SMALL CORRECTIONS WERE MADE TO THE DATUM. SEE FIELD BOOK NO. 1. PAGE NO. 13.
4. COORDINATES SHOWN ARE TRANSVERSE MERCATOR PROJECTION. EAST ZONE OF MISSISSIPPI.
5. FIELD SURVEYS WERE PERFORMED BY LEE HINES OF VERMION F. METER ASSOC. UNDER CONTRACT DAWC01-85-07-0026. ITER NO. 17. DELIVERY ORDER NO. 17.
6. THE INFORMATION DEPICTED ON THIS MAP REPRESENTS THE RESULTS OF SURVEYS MADE DURING JULY 1988, AND CAN ONLY BE CONSIDERED AS APPROXIMATE GENERAL COORDINATES EXISTING AT THAT TIME.
7. HORIZONTAL CONTROL WAS FURNISHED BY THE C.O.C. STATIONS USED WERE: PT-4 = N 263.940-11 E 508.749-87 PT-3 = N 264.759-88 E 507.282-87 HORN DAT = N 264.759-88 E 507.282-87
8. LINE SPACING = 500' INTERVALS. ELEVATIONS = 25' INTERVALS.

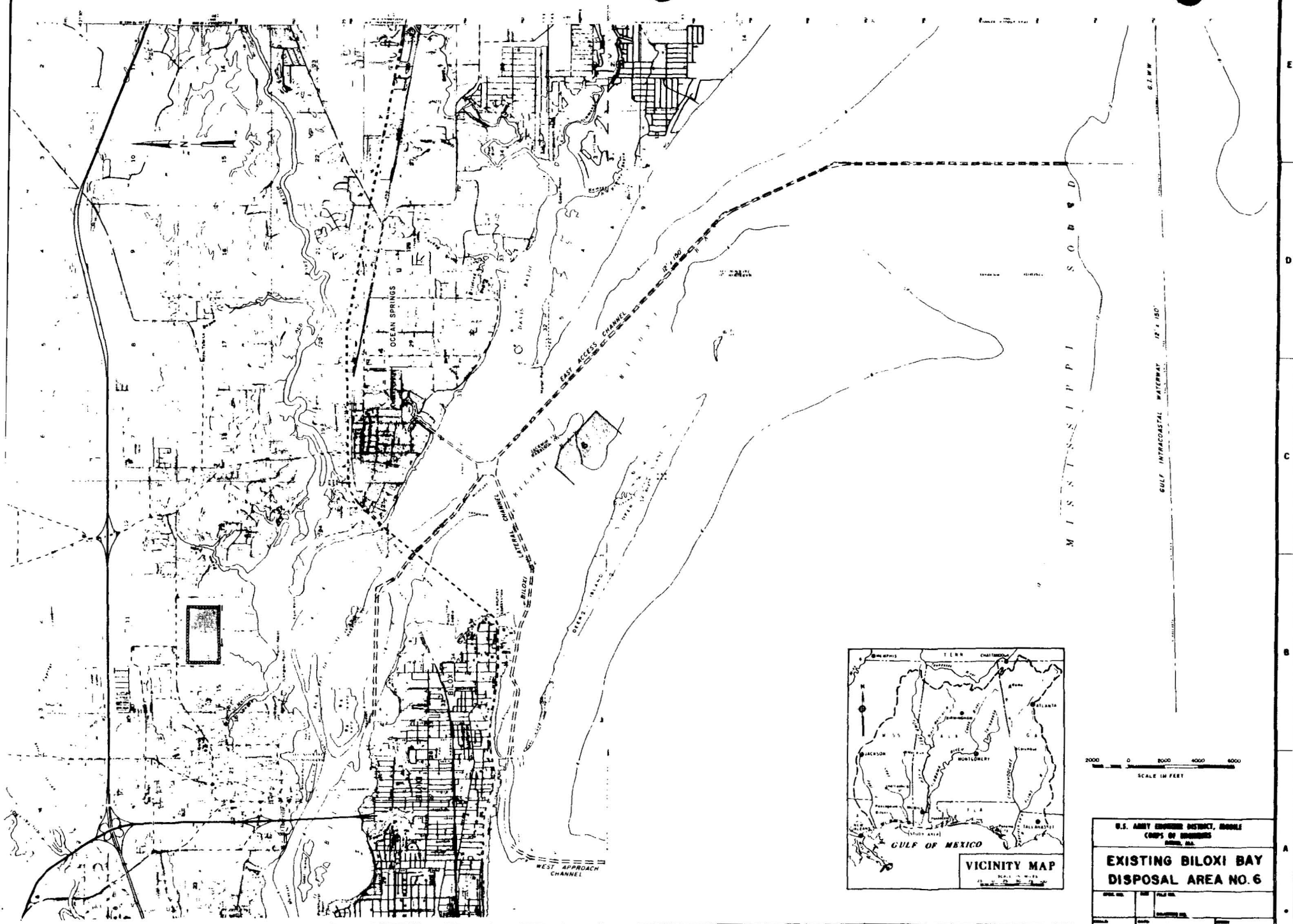
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CHECKED BY: J. PURPURA	DAVIS BAYOU OCEAN SPRINGS, MISS.		
SUPERVISOR BY: S. HEBERT			
SH. REF. NO.	SPEC. NO.	SIZE	FILE NO.
		DRAWING NO.	
DATE: 1-1-60	BY: J. L. G. 1-1-60	BY: J. L. G. 1-1-60	



635/60905 5 of 7





Biloxi East Access Channel

North	Sta. 25								
	-13.8	-13.8	-13.8	-13.7	-11.8	-10.0	-9.0	-10.0	-12.0
North	-8.8	-8.5	-10.0	-9.7	-8.0	-9.5	-10.4	-9.9	-10.1
	-6.6	-6.6	-6.8	-7.4	-6.1	-8.5	-6.9	-6.6	-9.9
	-6.2	-6.5	-6.9	-2.6	-7.5	-7.0	-6.8	-8.0	-9.8
	-6.0	-6.1	-6.4	-6.9	-7.5	-6.5	-9.0	-9.5	-9.5
	-6.1	-5.7	-6.0	-6.8	-7.3	-7.7	-6.5	-8.8	-9.3
	-6.0	-5.3	-5.5	-6.1	-7.0	-7.8	-6.7	-8.9	-9.0
	-5.5	-4.5	-5.0	-5.7	-6.2	-7.2	-6.4	-7.9	-8.9
	-5.3	-4.4	-4.3	-5.4	-5.9	-7.1	-6.8	-7.9	-8.5
	-4.2	-3.9	-4.1	-4.9	-5.4	-6.0	-6.7	-7.1	-8.4
	-3.9	-3.5	-4.1	-4.9	-5.4	-6.0	-6.3	-6.8	-8.1
	-3.7	-3.0	-3.3	-4.4	-5.4	-5.7	-6.1	-6.8	-8.0
	-3.8	-2.9	-3.6	-4.8	-5.4	-5.5	-6.1	-6.5	-6.7
	-3.8	-3.8	-4.1	-5.0	-5.5	-5.5	-6.1	-6.7	-7.7
	-3.9	-4.1	-4.5	-5.1	-5.7	-6.4	-6.5	-6.9	-8.5
	-4.6	-2.2	-4.7	-5.5	-6.0	-6.8	-7.2	-7.2	-6.1
	-4.8	-4.9	-5.4	-5.8	-6.4	-7.3	-7.8	-7.9	-8.1
	-5.2	-5.3	-5.4	-6.1	-6.8	-7.7	-7.8	-8.1	-8.5
	-5.2	-5.8	-5.3	-6.9	-7.1	-7.7	-8.0	-8.2	-6.3
	-5.8	-5.4	-6.1	-6.3	-6.9	-7.6	-8.2	-8.1	-8.4
	-6.0	-4.7	-5.4	-6.8	-5.9	-7.5	-7.8	-7.5	-7.0
	-6.4	-6.0	-6.4	-7.0	-7.2	-7.4	-7.2	-6.5	-5.7
	-5.9	-5.8	-5.7	-7.3	-7.3	-7.2	-5.6	-3.5	-4.0
	-5.6	-5.7	-6.4	-6.8	-6.8	-4.8	-2.9	-3.2	-3.5
	-5.7	-6.0	-6.2	-6.4	-6.3	-3.3	-3.1	-2.9	-3.4
	-5.5	-5.8	-6.0	-6.2	-3.5	-3.3	-2.9	-2.8	-3.2

Note: Depths shown are feet below
MLLW, October 1985.

BATHYMETRY BILOXI BAY
DISPOSAL AREA NO. 6

FIGURE 5